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CO-ORDINATION OF LATIN AND GREEK WITH THE OTHER SUBJECTS OF THE HIGH-SCHOOL CURRICULUM

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This paper deals with the co-ordination of Latin and Greek with chemistry.¹

Greek has paid the penalty imposed sooner or later by our present-day civilization upon every subject in the curriculum that refuses to meet its demand for immediate and demonstrable social service. When a few years ago Greek was deprived of the artificial support that college-entrance requirements had given it, instead of finding in that very revolution and the causes that underlay it a new principle which it must recognize thereafter if it would live, Greek has stubbornly refused to recognize or meet the demands of the new social ideals and has persisted in maintaining itself aloof, and even in priding itself upon that aloofness.

That policy has produced the present condition. If we are to restore Greek we must reverse that policy and, while holding fast to our faith in Greek as the finest possible instrument for the development of the *intellectual* and *spiritual* capacities of the pupil, we must socialize our Greek and develop to the highest point of efficiency the great capacities always inherent in it but heretofore largely ignored for *material* and practical service in the daily life of the pupil. The Greek ship of state lies useless in the harbor, not because it is less capable than before of traversing the high seas, but because it lacks the tug to get it started and enable it to thread its way amid the multiplicity of craft and through the narrow channel that together block its passage. We must provide that tug. We must provide it with that element which is not only fundamentally of great importance in itself and deserving of

¹ This paper has been prepared with the co-operation of Miss Jennie Hanna, head of the Department of Chemistry, East High School.

recognition for its own sake, but which tactically and strategically is of even greater importance, since it would enable Greek to get its clearance papers from our modern civilization and start for more distant shores.

This means a new type of beginners' book in Greek. The ideal illustrated by White's *First Greek Book*, magnificent as an instrument for realizing those higher but intangible values which we believe attach to Greek and justify its presence in the curriculum, must give place to another type, no less scholarly and no less effective as a cultural and disciplinary agent, but incorporating between its covers all points of contact with the daily environment of the pupil that the Greek language and civilization is capable of illuminating, whether in the field of language, art, architecture, history, or science. The vocabulary of this book, for example, will need to consider, not only the requirements involved in mastering the Greek language for its own sake, but also the requirements involved in making it a tool for immediate use in the mastery of contemporary subjects, such as science and mathematics, and in the interpretation of the Greek element in the ordinary linguistic environment of the pupil.

Definite, tangible material is as necessary for the continuous development of this phase of the work as in the mastery of the declensions and conjugations. It is for this reason that for the first time one of the papers of this series on co-ordination contains also the Greek element. Special investigations of this sort will not only equip the teachers with tangible applications for the Greek they are teaching, but will ultimately supply the textbook writers of the future with the material with which they must build.

In perhaps no other scientific field is the nomenclature so entirely Latin and Greek or the study of derivatives so illuminating as in chemistry. The entire development of many topics is vividly pictured forth to one who can interpret the root-meanings of the terms employed. This fact has led to a different arrangement in the following list than was employed in the biology and physics lists. The cumulative effect of the derivations of chemical terms would often be greatly impaired by the separation of naturally

associated terms involved in an alphabetical order. The arrangement is as follows:

1. A preliminary list of general terms alphabetically arranged.
2. Several topical lists with the words arranged in the order in which they naturally appear in the development. Only topics the importance of which is universally recognized are included.
3. An alphabetical list of the unusual or isolated words.

It is interesting to note that while in biology, physics, medicine, etc., there are many Greek words that have had a continuous history from the days of the Greek philosophers and scientists who first investigated these fields, in chemistry, on the contrary, there are no such words. Language thus reflects history. We owe much to the Greeks in biology, physics, and medicine, and our language recognizes that debt. We owe nothing to the Greeks in chemistry, which had its beginnings in the days of mediaeval alchemy and Arabic scientific research. So the language of chemistry possesses none of those direct inheritances of words that accompany the inheritance of ideas. The vast number of Greek words in chemistry are the deliberate borrowings of a developing science. The study of their derivation, while it fails to give the deeper glimpse into the continuity of human thought afforded in physics, is practically of more direct value, since the derivatives do not exhibit the changes in meaning that sometimes obscure the modern significance of an ancient word.

I. GENERAL CHEMICAL TERMS

English Word	Derivation and Definition
affinity	<i>adfinis</i> , neighboring, from <i>ad</i> , to, near+ <i>finis</i> , boundary= <i>closeness of relation</i> ; i.e., the force that <i>unites</i> dissimilar atoms in definite proportions.
attraction	<i>attrahere</i> , to draw to, from <i>trahere</i> , to draw+ <i>ad</i> , to=that property of matter by virtue of which it exercises a <i>pull</i> upon all other matter.
agent	<i>agens</i> , acting, present active participle of <i>agere</i> , to act=that which <i>acts</i> or does something; e.g., "the substance that produces oxidation is an oxidizing <i>agent</i> ."
reagent	<i>re</i> , back+ <i>agens</i> , pres. act. part. of <i>agere</i> , to act=a substance that produces in another a <i>reaction</i> of such a sort that the composition of the latter is ascertained.

English Word	Derivation and Definition
reaction	<i>re</i> , back+ <i>agere</i> , act=the series of changes involved in the chemical action of substances upon each other.
interact	<i>inter</i> , among+ <i>agere</i> , to act (used of several substances)=to cause chemical changes each in the other.
apparatus	<i>ad</i> , to+ <i>parare</i> , make ready=things <i>made ready</i> for some particular end, as an experiment in chemistry.
artificial	<i>artificium</i> , a craft, trade (from <i>ars</i> , art, skill+ <i>facere</i> , to make)+ <i>alis</i> , pertaining to=something constructed by the <i>craft</i> of man, not by nature; e.g., " <i>artificial</i> illuminating gas as opposed to natural gas."
condenser	<i>con</i> , together+ <i>densus</i> , thick=an apparatus for <i>reducing</i> a gas to a liquid form.
composition	<i>com</i> + <i>ponere</i> , put together=the general structure of a substance, the elements that have been put together to make it up.
component	an element which with others puts together or makes up a compound; e.g., "oxygen is a component of the air."
conservation	<i>con</i> (intensive), completely+ <i>servare</i> , save=the indestructibility of matter.
crystals	<i>κρύσταλλος</i> (<i>krystallos</i>), ice (from <i>κρύος</i> [<i>kruos</i>], cold), also rock-crystal, so called because of its resemblance to ice, of which it was supposed to be a permanent form; then=a body with symmetrical internal structure.
density	<i>densus</i> , thick=the quantity of matter per unit of space.
ductile	<i>ducere</i> , to lead, draw=capable of being <i>drawn</i> into wire.
elasticity	<i>ἔλανειν</i> (<i>elaunō</i>), to drive, push=that quality of returning to an original form after <i>extension</i> or compulsion (thereby affording a <i>projectile</i> power).
element	<i>elementum</i> , a first or basic principle from (possibly) LMN =the alphabet. Thus <i>lmn</i> would have been used as <i>abc</i> , in "he hardly knows the <i>abc</i> of the business."
equivalent	<i>aequus</i> , equal+ <i>valere</i> , to be worth=having same value.
exhauster	<i>ex</i> , out+ <i>hauire</i> , to draw+an apparatus for <i>drawing</i> the gas <i>out</i> of the hydraulic main.
fusible	<i>fundere</i> , to melt=able to be <i>melted</i> .
generator	<i>generare</i> , to produce (from <i>genus</i> , kind)+ <i>tor</i> , the agent=an apparatus for <i>producing</i> something.
ignite	<i>ignis</i> , fire=to set fire to.
isolation	<i>insula</i> , island= <i>separation</i> from all other substances.
laboratory	<i>laborare</i> , to work+ <i>torium</i> , place=a place for <i>working</i> experiments.
luster	<i>lustrare</i> , to shine=the quality of shining (cf. illustrious).
magnet	<i>μάγνης</i> (<i>magnēs</i>), a stone of Magnesia, a district in Thessaly, where magnetic ore first came to notice.

English Word	Derivation and Definition
metal	<i>μέταλλον</i> (<i>metallon</i>), mine, from <i>μεταλλᾶν</i> (<i>metallan</i>), to search after.
metathesis	<i>μετά</i> (<i>meta</i>), over+ <i>τιθέναι</i> (<i>tithenai</i>), put=transposition, exchange of places by parts of different substances.
mineral	<i>minare</i> , to open a mine=a substance found by <i>mining</i> , an inorganic body found in <i>natural state</i> .
opaque	<i>opacus</i> , shady=not transparent.
petrified	<i>πέτρα</i> (<i>petra</i>), rock+ <i>ficare</i> , to make=turned into <i>stone</i> .
pneumatic	<i>πνευματικός</i> (<i>pneumatikos</i>), relating to air, from <i>πνεῦμα</i> (<i>pneuma</i>), air=applied to any device that depends upon <i>air pressure</i> .
refine	<i>finire</i> , to finish, from <i>finis</i> , end=to <i>finish off</i> , purify.
refractory	<i>re</i> , back, off+ <i>frangere</i> , to break=resisting, stubborn; e.g., “refractory brick resists fire without crumbling.”
retort	<i>re</i> , back+ <i>torquere</i> , to twist=a chemical apparatus so called because of its <i>shape</i> .
stability	<i>stare</i> , to stand+ <i>bilis</i> , able=the property of being able to resist change; e.g., “the elements are characterized by <i>stability</i> .”
instability	<i>in</i> , not+ <i>stare</i> , to stand+ <i>bilis</i> , able=the tendency of matter to decompose or disintegrate.
substitution	<i>sub</i> , under, instead of+ <i>statuere</i> , to place=the <i>replacement</i> of one kind of matter by another, one of the four kinds of chemical action.
transparent	<i>trans</i> , across, through+ <i>parere</i> , to appear=having the property of allowing objects to <i>appear through</i> , of transmitting rays of light.

II. ELEMENTS WHOSE SYMBOLS ARE DERIVED FROM THEIR LATIN NAMES

silver	Ag.= <i>argentum</i> , silver.
gold	Aur.= <i>aurum</i> , gold.
copper	Cu.= <i>cuprum</i> , copper=a metal so called by the Romans because they obtained it from the island of <i>Cyprus</i> .
iron	F.= <i>ferrum</i> , iron.
lead	Pb.= <i>plumbum</i> , lead (cf. plumber and plumb-line).

III. OXYGEN

oxygen	<i>ὀξύς</i> (<i>oxus</i>), sharp, pungent, acid+ <i>γενής</i> (<i>genes</i>), producing; an element so named because it was originally supposed to be <i>present</i> in all <i>acids</i> .
oxide	<i>ὀξύς</i> (<i>oxus</i>), sharp, acid+ <i>idum</i> , a suffix forming the names of compounds=a <i>compound</i> of <i>oxygen</i> with another element.

English Word	Derivation and Definition
dioxide	$\delta\iota\alpha$ (<i>di</i>), two+oxide=an <i>oxide</i> containing <i>two</i> atoms of <i>oxygen</i> to one of another element.
trioxide	$\tau\rho\iota\alpha$ (<i>tri</i>), three+oxide=an oxide containing three atoms of <i>oxygen</i> to one of another element.
pentoxide	$\pi\acute{e}\nu\tau\epsilon$ (<i>pente</i>), five+oxide=(cf. above).
oxidation	oxide (see above)+ation, showing action=the <i>union of oxygen</i> with an element burning in it.
combustion	comb for <i>com</i> (intensive), completely+ <i>ustus</i> , perf. pass. part. of <i>urere</i> , burn=a <i>burning up</i> , rapid oxidation caused by the union of oxygen with an element capable of such union.
spontaneous	<i>sponte</i> , of one's own accord, without external cause; e.g., "the <i>spontaneous</i> decomposition of certain elements"; " <i>spontaneous combustion</i> ."
ozone	$\delta\zeta\epsilon\nu$ (<i>odzein</i>), to smell=a modified form of oxygen having a peculiar <i>odor</i> .
reduction	<i>re</i> , back+ <i>ducere</i> , to lead=the process of <i>restoring</i> a substance by removing the substances combined with it, in particular the removal of oxygen; e.g., "in <i>oxidation</i> the oxidizing agent undergoes <i>reduction</i> ."
phlogiston	$\phi\lambda\omega\gamma\zeta\epsilon\nu$ (<i>phlogidzein</i>), to burn, from $\phi\lambda\omega\zeta$ (<i>phlox</i>), flame (cf. the flower <i>phlox</i>)=an element that was formerly supposed to be present in all <i>combustible</i> substances.
inversely	<i>in</i> , to, toward+ <i>vertere</i> , turn=turned in an opposite direction (opposite of directly); e.g., "the volume of a gas is <i>inversely proportional</i> to the pressure"; i.e., the less the pressure the greater the volume.
proportional	<i>pro</i> , in accordance with+ <i>portio</i> , share (from <i>pars</i> , part)=possessing a suitable <i>share</i> of something <i>in relation to</i> some property (see inversely).

IV. HYDROGEN

hydrogen	$\eta\delta\omega\rho$ (<i>hudōr</i>), water+ <i>γενής</i> (<i>genes</i>), producing, an element so called because it was regarded by Lavoisier as essential for <i>forming water</i> .
fermentation	<i>fervere</i> , to boil+ation, the action=the <i>agitation</i> and decomposition produced in organic substances by certain agents.
occlusion	<i>ob</i> , before, up+ <i>claudere</i> , to shut=the <i>shutting up</i> or concealing of a gas by a metal (i.e., absorption), "the <i>occlusion</i> of hydrogen by palladium."
diffusion	<i>dis</i> , apart+ <i>fundere</i> , pour, spread=the <i>spreading</i> of two liquids or gases through each other without agitation; e.g., "the rate of <i>diffusion</i> of hydrogen is four times that of oxygen."

V. WATER

English Word	Derivation and Definition
atmosphere	$\dot{\alpha}\tau\mu\acute{o}s$ (<i>atmos</i>), vapor+ $\sigma\phi\acute{a}i\acute{r}a$ (<i>sphaira</i>), sphere=the globe of air that surrounds the earth.
vapor	<i>vapor</i> , steam=any substance diffused in the air like <i>steam</i> ; e.g., "water in the form of vapor is present in the atmosphere."
erosion	<i>e</i> , out, off+ <i>rodere</i> , gnaw=to <i>wear away</i> (cf. rodent); e.g., "water is the great agent in the erosion of the soil."
evaporation	<i>e</i> , out+ <i>vapor</i> , steam=the passing <i>off</i> of a liquid into <i>steam</i> or vapor.
expand	<i>ex</i> , out+ <i>pandere</i> , spread=to <i>spread out</i> , to increase in size; e.g., "water expands upon freezing."
capillary	<i>capillus</i> , hair+ <i>aris</i> , pertaining to= <i>hair-like</i> , applied to forces of attraction acting at <i>minute</i> distances.
distillation	<i>de</i> , down+ <i>stillia</i> , drop=the process of vaporizing and then condensing a liquid, the latter step proceeding <i>drop by drop</i> ; e.g., "to distil water."
diluent	pres. act. part. of <i>diluere</i> , from <i>dis</i> , apart+ <i>luere</i> , to wash=a substance that makes another <i>more liquid</i> .
solvent	pres. act. part. of <i>solvare</i> , to loosen=a substance that can <i>reduce</i> another to a <i>liquid</i> state; e.g., "water possesses remarkable solvent powers."
dissolve	<i>dis</i> , apart+ <i>solvare</i> , to loosen=to <i>separate</i> the particles of a solid in a liquid.
soluble	<i>solvare</i> , loosen+ <i>bilis</i> , able=able to be dissolved; e.g., "oxygen is <i>soluble</i> in water."
solubility	<i>solvare</i> , to loosen+ <i>bilis</i> , able=the property of being able to be dissolved.
solute	perf. pass. part. of <i>solvare</i> =that which is <i>dissolved</i> .
solution	<i>solvare</i> , to loosen=a <i>liquid</i> produced by transforming solid matter to a <i>liquid</i> state by means of a solvent.
dilute	<i>dis</i> , apart, away+ <i>luere</i> , to wash=to <i>make something more fluid</i> by mixing it with a fluid of less consistency; e.g., "to dilute with water."
synthesis	$\sigma\acute{w}$ (<i>sūn</i>), together+ $\tau i\theta\acute{e}vai$ (<i>tithenai</i>), place=the union or combination of different kinds of matter; e.g., "the <i>synthesis</i> of hydrogen and oxygen produces water."
analysis	$\grave{a}v\acute{a}$ (<i>ana</i>), back+ $\lambda\acute{v}e\acute{v}i$ (<i>luein</i>), loosen=to undo or separate a compound into the elements composing it.
decomposition	<i>de</i> , down, back+ <i>componere</i> , to put together=a separation of matter into its components.
electrolysis	$\tilde{\eta}\lambda\acute{e}k\tau\rho\acute{o}v$ (<i>electron</i>), amber, i.e., electricity+ $\lambda\acute{v}\sigma i\acute{s}$ (<i>lusis</i>), a loosing, separating=the <i>decomposition</i> of a compound by <i>electricity</i> .

English Word	Derivation and Definition
eudiometer	<p><i>εὐδίος</i> (<i>eudios</i>), calm, pure (e.g., of weather) + <i>μέτρον</i> (<i>metron</i>), measure=an instrument originally used to test the <i>purity</i> of the <i>air</i>, now employed in the <i>analysis</i> of <i>gases</i>.</p>
gravimeter	<p><i>gravis</i>, heavy + <i>metron</i> (Gr. <i>μέτρον</i>), measure=an instrument for determining specific gravity.</p>
gravimetric	<p>gravimeter+ic, <i>ικός</i> (<i>ikos</i>), pertaining to=pertaining to measurement by weight, opposed to volumetric; e.g., "the gravimetric and volumetric composition of water is 1 part hydrogen to 8 parts oxygen."</p>
volumeter	<p><i>volumen</i>, a volume + <i>μέτρον</i> (<i>metron</i>)=an instrument for measuring the volume of gases.</p>
volumetric	<p>volumeter+ic (= <i>ικός</i> [<i>ikos</i>], pertaining to)=pertaining to measurements by volume, opposed to gravimetric; e.g., "the volumetric composition of water is 1 volume of oxygen + 2 volumes of hydrogen."</p>
qualitative	<p>(analysis), <i>qualis</i>, of what sort or kind + <i>tas</i>, the abstract idea=the study of the properties of a compound to determine what the constituent elements are; in distinction from—</p>
quantitative	<p>(analysis), <i>quantus</i>, how much + <i>tas</i>, the abstract idea=the determination of the exact amounts and proportions of the constituents.</p>
concentrated	<p><i>con</i>, together + <i>centrum</i>, center=drawn to a common center, drawn together, intensified; e.g., "a solution containing a large proportion of the solute is called concentrated."</p>
effervescence	<p><i>ex</i>, out + <i>fervere</i>, to boil=to bubble and hiss spontaneously; e.g., "the rapid escape of a gas is called effervescence."</p>
saturated	<p><i>satur</i>, full=filled with something till no more can be received; e.g., "a solution is saturated when it will dissolve no more solid."</p>
precipitate	<p><i>praeceps</i>, headlong (<i>prae</i>, before + <i>caput</i>, head)=to cause to fall headlong; i.e., as a sediment; also=the sediment so deposited, as produced by a solution of camphor and water.</p>
supersaturated	<p><i>super</i>, above, beyond=saturated or filled to excess, as in the case of certain hot concentrated solutions that lose none of the solute on cooling.</p>
efflorescence	<p><i>ex</i>, out + <i>florere</i>, to flower=the formation of white flower-like deposits on the surface of certain bodies; also=the property by which some crystals lose their water and crumble when exposed to air.</p>
anhydrous	<p><i>ἀν-</i> (<i>an</i>), not + <i>ὑδωρ</i> (<i>hudōr</i>), water=without water; e.g., "crystals losing their water and crumbling on exposure to air are said to be dehydrated or anhydrous."</p>

English Word	Derivation and Definition
dehydrate	<i>de</i> , down, from, away + <i>ὕδωρ</i> (<i>hudōr</i>), water = to deprive of water (<i>see anhydrous</i>).
deliquescence	<i>de</i> , down, from, away + <i>liquere</i> , to become liquid = to become <i>moist</i> or <i>liquid</i> by absorption of moisture from air; e.g., “common salt because of the presence of calcium chloride often deliquesces in damp weather.”
dissociate	<i>dis</i> , apart + <i>socius</i> , ally = to <i>split up</i> or decompose the elements of a substance; e.g., “a solute that is partially dissociated into ions conducts electricity.”

VI. THE ATMOSPHERE

air	<i>aer</i> , air, from Greek <i>ἀήρ</i> (<i>aēr</i>), air, the <i>atmosphere</i> (one of the four elementary principles that according to Aristotle made up all substances—fire, air, water, earth).
ingredient	<i>ingrediens</i> , pres. act. part. of <i>ingredi</i> , to enter, from <i>in</i> , in + <i>gradī</i> , to walk = that which <i>enters into</i> the composition of a substance.
humidity	<i>humidus</i> , moist = the state of being moist; e.g., “when the air contains its maximum amount of moisture its humidity is said to be 100.”
argon	ἀ (<i>a</i>), not + <i>ἔργον</i> (<i>ergon</i>), work = inactive, describing the chief characteristic of the element so called.
inert	<i>iners</i> , unskilled in any art, from <i>in</i> , not + <i>ars</i> , art = <i>inactive</i> , having <i>no</i> inherent powers of <i>action</i> .
helium	<i>ἥλιος</i> (<i>helios</i>), sun = an element first recognized by the lines of the solar spectrum.
neon	<i>νέος</i> (<i>neos</i>), new = the name applied to a <i>recently</i> discovered element in the air.
krypton	<i>κρυπτόν</i> (<i>krypton</i>), concealed = an element of the air recently discovered that has long <i>evaded</i> discovery.
xenon	<i>ξένος</i> (<i>xenos</i>), stranger = the name of a <i>recently discovered</i> element in the air.

VII. NITROGEN

nitric	<i>νίτρον</i> (<i>nitron</i>), native soda.
nitrification	<i>nitrum</i> , niter + <i>ficare</i> , to make = the process by which the <i>nitrogen</i> of the soil is <i>oxidized</i> to nitric acid.
ammonia	a substance so called because of the supply obtained in ancient times from the vicinity of the Temple of Jupiter <i>Ammon</i> in Africa.
volatile	<i>volare</i> , to fly = <i>evaporating</i> rapidly; e.g., “ammonia is a very volatile gas.”
aqua fortis	<i>aqua</i> , water; <i>fortis</i> , strong = a term formerly given to nitric acid because of its <i>strong</i> reactions.

English Word	Derivation and Definition
aqua regia	<i>aqua</i> , water; <i>regia</i> , royal=a term applied to a mixture of nitric and hydrochloric acid that has the power to dissolve the "noble" metals, gold and platinum.
theory	<i>θεωρία</i> (<i>theōria</i>), a seeing, a contemplation, speculation (cf. theater, from the same source=a place where one sees plays) (cf. also speculation, from <i>specere</i> , to see, as in spectacle)=an explanation of observed facts.
hypothesis	<i>ἱπόθεσις</i> (<i>hypothesis</i>), from <i>ἱπτο-</i> , under+ <i>θέσις</i> (<i>thesis</i>), a placing=that which is placed under something else; i.e., that which is assumed as a <i>basis</i> for explaining or proving something else (cf. also supposition, from <i>sub</i> , under+ <i>ponere</i> , place)=a tentative theory or supposition taken as the <i>basis</i> of further experiments.
nomenclature	<i>nomen</i> , name+ <i>calare</i> , call=a system of names; e.g., "the nomenclature of chemistry is mainly Greek."
molecule	<i>moles</i> , mass+ <i>culus</i> , little=the smallest part of a compound or element that can exist in a free state; e.g., "the smallest particle of water is a molecule which contains smaller particles still, viz., atoms of hydrogen and oxygen."
atom	ἀ (a), not+ <i>τέμνειν</i> (<i>temnein</i>), to cut=something that cannot be divided further=the indivisible constituent of a molecule.
symbol	<i>συμβάλλειν</i> (<i>symballein</i>), to throw together, come to a conclusion, conjecture, from <i>συμ-</i> (<i>sym</i>), together+ <i>βάλλειν</i> (<i>ballein</i>), to throw=that from which one <i>conjectures</i> or <i>concludes</i> something, an external sign (cf. conjecture from <i>con</i> , together+ <i>jacere</i> , to throw).
formula	<i>formula</i> , from <i>forma</i> , pattern+ <i>ula</i> , little=a small pattern=a <i>fixed group</i> of symbols expressing the composition of a substance.
equation	<i>aequus</i> , equal=an expression of <i>equality</i> .
factors	<i>factor</i> , maker, from <i>facere</i> , to make+ <i>tor</i> , the agent=one of the substances entering into a chemical reaction, forming the first half of a chemical equation.
product	<i>pro</i> , forth+ <i>ducere</i> , to bring=that which is brought forth from a chemical reaction, forming the second half of a chemical equation.
acid	<i>acidus</i> , sour (cf. <i>acetum</i> , vinegar)=a substance having a sour taste, applied to a group of substances that possess that characteristic.

English Word	Derivation and Definition
acetic	<i>acetum</i> , vinegar=an acid, 2 per cent of which is found in vinegar.
citric	<i>citrus</i> , citron tree=pertaining to citrons or lemons; e.g., citric acid, an acid found in large quantity in lemons.
base	<i>βάσις (basis)</i> , bottom, foundation=a <i>foundation</i> substance which unites with an acid to form a salt.
salt	<i>sal</i> , salt=a name given to a class of substances of which common salt, sodium chloride, is the most familiar.
neutralization	<i>neuter</i> , neither (cf. neuter gender)=to combine an acid and a base in such a way that the resulting compound has <i>neither</i> base nor acid properties.
radical	<i>radix</i> , a root=a group of atoms of hydrogen and oxygen acting as a <i>unit</i> in neutralization.
valence	<i>valere</i> , to be strong=the <i>power</i> of atoms of an element to hold in combination a certain number of other atoms.
quantivalence	<i>quantus</i> , how much?+ <i>valere</i> , be strong=valence.
univalent	<i>unus</i> , one
bivalent	<i>bi-</i> , two
trivalent	<i>tri-</i> , three
quadrivalent	<i>quadri-</i> , four
quinquivalent	<i>quinque-</i> , five
monad	<i>μόνος (monos)</i> , one
dyad	<i>δύω (duo)</i> , two
triad	<i>τρεῖς (treis)</i> , three
tetrad	<i>τέτταρος (tettaros)</i> , four
pentad	<i>πέντε (pente)</i> , five
empirical	<i>ἐν (en)</i> , in+ <i>πείρα (peira)</i> , trial=pertaining to trials or experiments; e.g., "empirical knowledge is derived from experiments."
-ous	<i>-osus</i> , full of=a suffix affixed to the name of an acid having <i>more</i> of the element and less of the oxygen; e.g., sulphurous, phosphorous.
-ic	<i>-ικος (ikos)</i> , pertaining to=a suffix affixed to the name of the best-known acid of an element; e.g., sulphuric, nitric.
per-	<i>per</i> , thoroughly=indicating <i>superior</i> strength, opposed to <i>hypo-</i> ; e.g., permanganate.
hypo-	<i>ὑπό (hypo)</i> , under=indicating <i>inferior</i> strength, opposed to <i>per-</i> ; e.g., hypophosphate.
hydro-	<i>ὕδωρ (hudor)</i> , water=a prefix in many words meaning <i>water</i> , but in chemical compounds other than hydrogen meaning <i>hydrogen</i> , specifically applied to an acid having no oxygen; e.g., hydrochloric.

English Word	Derivation and Definition
monobasic	<i>μόνος (monos)</i> , one
dibasic	<i>δι-</i> (<i>di-</i>), two
tribasic	<i>τρι-</i> (<i>tri-</i>), three
polybasic	<i>πολύ (polu)</i> , many
	applied to acids containing respectively one, two, three, or many atoms of hydrogen replaceable by a metal.

IX. ELECTRO-CHEMISTRY

caloric	<i>calor</i> , heat=pertaining to heat.
endothermic	<i>ἔνδον (endon)</i> , within+θέρμη (<i>thermē</i>), heat=taking <i>in</i> or absorbing heat; e.g., "an endothermic compound absorbs heat."
exothermic	<i>ἔξω (exo)</i> , without+θέρμη (<i>thermē</i>), heat=letting <i>out</i> or liberating heat; e.g., "an exothermic compound liberates heat."
electricity	<i>electrum</i> , from ἥλεκτρον (<i>elektron</i>), amber=a force so named because of the susceptibility of amber to electrification.
electrification	<i>electrum</i> , amber=electricity+ <i>ficare</i> , make, from <i>facere</i> , make=charging something with electricity.
electrolysis	ἥλεκτρον (<i>elektron</i>)+λύσις (<i>lisis</i>), a loosing=the <i>decomposition</i> involved in passing an <i>electric</i> current through a compound.
electrolyte	ἥλεκτρον (<i>elektron</i>)+λυτός (<i>lutos</i>), loosed=the substance decomposed by electricity.
electrodes	ἥλεκτρον, etc.+ὅδος (<i>hodos</i>), road=the two <i>rods</i> that conduct the <i>electricity</i> to and from the electrolyte.
anode	ἀνά (<i>ana</i>), up+ὅδος (<i>hodos</i>), road=the pole at which an electric current <i>enters</i> a positive pole.
cathode	κατά (<i>kata</i>), down+ὅδος (<i>hodos</i>), road=the pole at which a current <i>leaves</i> the negative pole.

X. CARBON AND THE COMPOUNDS

carbon	<i>carbo</i> , coal=the element one form of which is <i>coal</i> .
amorphous	ἀ (a), not+μορφή (<i>morphe</i>), form= <i>formless</i> ; e.g., "coal is an amorphous carbon."
diamond	=the same word as adamant, with changes in spelling to imitate diaphanous (transparent), from ἀδάμας (<i>adamas</i>), unconquerable, from ἀ (a), not+δαμᾶν (<i>daman</i>), to conquer=so called because of its <i>hardness</i> .
graphite	γράφειν (<i>graphein</i>), to write=a form of carbon so called because of the property of leaving a black mark on paper.
lignite	<i>lignum</i> , wood=coal in which the original form of the <i>wood</i> can be recognized by the eye.
bituminous	<i>bitumen</i> , various hydrocarbons; e.g., petroleum, etc., now=a form of coal containing considerable hydrogen.

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English Word	Derivation and Definition
anthracite	<i>ἀνθραξ</i> (<i>anthrax</i>), charcoal=a variety of mineral coal almost pure carbon.
allotropism	<i>ἄλλος</i> (<i>allos</i>), another+ <i>τρόπος</i> (<i>tropos</i>), way, form=that property of certain elements by which they exist in two or more <i>different forms</i> ; e.g., “carbon exists in the forms of the diamond, graphite, and charcoal.”
kerosene	<i>κηρός</i> (<i>kēros</i>), wax, parafine.
petroleum	<i>πέτρα</i> (<i>petra</i>), rock (cf. petrify)+ <i>oleum</i> , oil= <i>rock oil</i> , an oily substance oozing naturally from crevices in <i>rocks</i> and obtained by boring into the rock.
ethyl (ethylene)	ether+ <i>υλη</i> (<i>hulē</i>), matter=the hypothetical <i>radical</i> of alcohol and ether. Ethylene differs in having one less atom of hydrogen.
olefiant	<i>oleum</i> , oil+ <i>ficare</i> , to make= <i>forming oil</i> ; e.g., “ethylene is an olefiant gas.”
methyl (methane)	<i>μέθυ</i> (<i>methu</i>), mead, wine+ <i>υλη</i> (<i>hulē</i>), matter=the hypothetical <i>radical</i> of wood spirits. Methane differs in having one more atom of hydrogen.
acetyl (acetylene)	<i>acetum</i> , acid+ <i>υλη</i> (<i>hulē</i>), matter=the hypothetical, univalent <i>radical</i> of acetic acid. Acetylene is composed of two atoms each of hydrogen and carbon.
cyanogen	<i>κιάνος</i> (<i>kuanos</i>), dark-blue+ <i>γενής</i> (<i>genēs</i>), producing=a gas composed of nitrogen and carbon, producing a purple flame.
organic	<i>օργανον</i> (<i>organon</i>), organ of body, from <i>ἔργον</i> (<i>ergon</i>), work=having a connection with <i>living things</i> , with bodies having <i>organs</i> ; e.g., “organic compounds”; now applied to compound of carbon.
inorganic	<i>in</i> , not+organic=having <i>no</i> connection with <i>living things</i> ; e.g., “inorganic or mineral compounds in the earth’s crust.”
ether	<i>αιθήρ</i> (<i>aithēr</i>), the upper, purer air, as opposed to <i>ἀήρ</i> (<i>aēr</i>), the lower air=(in physics) that substance of extreme thinness supposed to be diffused through space; (in chemistry)=an extremely <i>light</i> and <i>volatile</i> liquid, used as an anaesthetic.
isomer	<i>ἴσος</i> (<i>isos</i>), equal+ <i>μέρος</i> (<i>meros</i>), share=a substance that is <i>like</i> another in composition and molecular weight, but unlike in physical or chemical properties.
polymerism	<i>πολύ</i> (<i>polu</i>), many=that variety of isomerism in which the percentage composition is identical but the molecular weights different.
matamerism	<i>μετά</i> (<i>meta</i>), after+ <i>μέρος</i> (<i>meros</i>), share=a form of isomerism in which substances identical in chemical composition differ in chemical properties.

English Word	Derivation and Definition
albumen	<i>albumen</i> , white of eggs, from <i>albus</i> , white=any nutritive matter like <i>white</i> of egg.
gelatine	<i>gelare</i> , to freeze (cf. congeal)=a <i>transparent hard</i> animal substance.
stearin	<i>στέαρ (stear)</i> , fat=a substance so called because of its fatty constituency.
saponification	<i>sapo (saponis)</i> , soap+ <i>ficare</i> , to make=the production of soap.
saccharose	<i>σάκχαρ (sakchar)</i> , sugar=a general name for any crystalline sugar.
glucose	<i>γλυκύς (glukus)</i> , sweet=the name of a sugar.
luminosity	<i>lumen</i> , light+ <i>osus</i> , full of=the <i>capacity</i> of a gas to give <i>light</i> .
ion	<i>ἰον (ion)</i> , a going, wandering=the independent particles into which the electrolyte is <i>decomposed</i> .
cation	<i>κατά (kata)</i> , down+ <i>ἰον (ion)</i> , a going=that ion which moves <i>down</i> to the cathode.
anion	<i>ἀνά (ana)</i> , up+ <i>ἰον (ion)</i> , a going=that ion which moves <i>up</i> to the anode.
current	pres. act. part. of <i>currere</i> , to run=a flowing, a term used in electricity although its nature is unknown and although it does not flow in one direction.
electrotypes	<i>ἤλεκτρον (elektron)</i> , etc.+ <i>τύπος (tupos)</i> , figure, image=an exact <i>image</i> of the original objects produced by <i>electricity</i> .

XI. HALOGENS

halogen	<i>ἄλς (hals)</i> , salt+ <i>γενῆς (genēs)</i> , producing=a term applied to a group of elements that <i>form salts</i> resembling common salt.
halide	<i>ἄλς (hals)</i> , salt=a name applied to certain salts.
iodine	<i>ἴώδης (iōdēs)</i> , violet-like, from <i>ἰον (ion)</i> , violet+ <i>εἶδος (eidos)</i> , appearance=an element so called because of the beautiful <i>violet color</i> that its heated vapor has.
bromine	<i>βρῶμος (brōmos)</i> , stench=an element so called because of its powerful <i>disagreeable odor</i> .
fluorine	<i>fluere</i> , to flow=an element so called because it is the most <i>active</i> of all the elements.
chlorine	<i>χλωρός (chlōros)</i> , greenish-yellow=a gas distinguished by a <i>greenish-yellow color</i> .
muriatic	<i>muria</i> , brine=the commercial name of hydrochloric acid, so called to emphasize its relation to <i>salt</i> , sodium chloride.
nascent	pres. act. part. of <i>nasci</i> , be born=coming into being, commencing, the condition of an element the instant it is set free from a combination and is <i>just ready</i> to unite with elements for which it has affinity.

English Word	Derivation and Definition
antichlor	ἀντί (anti), against + chlorine = a substance used to <i>counteract</i> the effect of chlorine.
hydrochloric	ὕδωρ (hudōr), water + χλωρός (chlōros), greenish-yellow = a compound of hydrogen and chlorine; chlorine has a greenish-yellow color, and hydrogen is one of the chief components of water.

XII. SPECIAL, UNUSUAL, AND ISOLATED TERMS

abrasive	<i>ab</i> , away + <i>radere</i> , scrape = tending to wear away; e.g., "carborundum is used in whetstones because of its abrasive property."
alloy	<i>ad</i> , to + <i>ligare</i> , to bind (cf. ligament) = a compound of two or more metals.
amalgam	μαλάσσειν (<i>malassein</i>), to soften, from μαλακός (<i>malakos</i>), soft = a compound of mercury used in extracting gold and silver.
analogous	ἀνά (ana), according to + λόγος (<i>logos</i>), word, reason, ratio = according to proper proportion, <i>corresponding</i> in certain respects; e.g., "saturation is analogous to stable equilibrium."
azote	ἀ (a), not + ζῆν (<i>zēn</i>), to live = a name formerly applied by Lavoisier to nitrogen because it does <i>not</i> sustain <i>life</i> .
apatite	ἀπάτη (<i>apate</i>), illusion, deceit = a substance so called because it has often been <i>mistaken</i> for other minerals.
arsenic	ἄσπερν (<i>arsēn</i>), male = an element originally so called because of its <i>powerful</i> qualities.
bacteria	plural of <i>bacterium</i> , from βακτήριον (<i>baktērion</i>) a little staff, diminutive of βάκτρον (<i>baktron</i>), staff, so called because of their rod-like appearance (cf. <i>bacillus</i> , a little staff, from <i>baculus</i> , staff).
barium	βαρύς (<i>barus</i>), heavy = an element so called because of its <i>high specific gravity</i> .
calcium	καλξ (<i>calx</i>), lime = an element so called because its most abundant form is <i>limestone</i> .
catalysis	κατά (kata), down + λύειν (<i>luein</i>), loose = the <i>decomposition</i> of a substance by contact with another change in the latter; e.g., "platinum is used as a catalytic agent in manufacturing sulphuric acid."
chromium	χρῶμα (<i>chrōma</i>), color = an element so called because most chromium compounds have decided <i>color</i> .
caustic	καύειν (<i>kauein</i>), to burn = burning, destroying; e.g., "caustic potash quickly destroys vegetable and animal tissues."

English Word

centigrade

Derivation and Definition

- centum*, one hundred+*gradus*, degree=a thermometer that divides the interval between freezing and boiling points into 100 degrees.
- chalybeate** χάλυψ (*chalyps*), steel, iron=a mineral water impregnated with *iron*.
- corrode** *con*, together+*rodere*, to gnaw to pieces=*eating away* gradually (cf. *erode*).
- corrosive** *con*, together+*rodere*, to gnaw to pieces=*eating away* gradually (cf. *erosion*); e.g., "concentrated acids are corrosive."
- cryolite** κρύος (*kruos*), cold, ice+λίθος (*lithos*), stone=a substance so called because it often resembles *clouded ice*.
- cuprous (cupric)** *cuprum* (see copper).
- cycle** κύκλος (*kuklos*), circle=a *circle*.
- deflagration** *de*, down, out+*flagrare*, to burn=to *burn up rapidly*, as when a powerful oxidizing agent like potassium nitrate is dropped on charcoal.
- eclipse** ἐκλεψίς (*ekleipsis*), from ἐκ- (*ek*), out, off+λείπειν (*leipein*), to leave off, cease=the *cessation* of the light of the sun, etc., through intervention of another body.
- equilibrium** *aequus*, equal+*libra*, balance=an *equal balance*.
- flux** *fluere*, a flowing=a substance used to assist *fusion*.
- fuming** *fumus*, smoke=giving off *smoke* or gas.
- glycerine** γλυκερός (*glukeros*), sweet (cf. glucose)=a particular liquid with a *sweet taste*.
- lactic** *lac* (*lactis*), milk=pertaining to milk; e.g., "sour milk contains lactic acid."
- lithium** λίθος (*lithos*), stone=an element so called because of its *metallic luster*.
- lotion** *lavare*, to wash=a washing, then=a *fluid* holding in solution various medicinal substances.
- malleable** *malleus*, hammer=capable of being extended by hammering or rolled into sheets.
- meteorites** μετέωροι (*meteōron*), from μετά (*meta*), beyond+ἀείρειν (*aeirein*), lift up=something suspended on *high*, specifically=a small body moving in space.
- metalloid** μέταλλον (*metallon*)+εἶδος (*eidos*), form=having the form of a metal.
- metallurgy** μέταλλον (*metallon*)+ἔργον (*ergon*), work=the working of metals.
- metastannic** μετά (*meta*), with, related to+*stannum*=an acid formed from tin by the addition of nitric acid.

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English Word	Derivation and Definition
monoclinic	<p><i>μόνος</i> (<i>monos</i>), single + <i>κλίνειν</i> (<i>klinein</i>), to lean = a form of crystal characterized by three unequal axes, two of which intersect at an oblique angle while they are at right angles to the <i>third</i>.</p>
mordant	<p><i>mordere</i>, to bite = a substance that has a strong affinity for a tissue to be colored and can be used to <i>fix</i> colors.</p>
naphtha	<p><i>νάφθα</i> (<i>naphtha</i>), a kind of asphalt.</p>
natrium	<p>through Arabic <i>natrun</i>, from <i>νίτρον</i> (<i>nitron</i>), native soda = sodium carbonate, a term furnishing the symbol Na for sodium.</p>
orthorhombic	<p><i>ὀρθός</i> (<i>orthos</i>), straight + <i>ῥόμβος</i> (<i>rhombos</i>), a rhomb = a form of crystal characterized by three unequal axes intersecting at <i>right</i> angles.</p>
permanganate	<p><i>per</i>, through, thoroughly, a prefix of intensity, denoting the maximum amount; e.g., "permanganate contains more manganese than a manganate."</p>
phosphorus	<p><i>φῶς</i> (<i>phōs</i>), light + <i>φέρειν</i> (<i>pherein</i>), to bear = an element so called because of its property of <i>glowing</i> in moist air.</p>
reverberatory	<p><i>re</i>, back + <i>verbare</i>, to beat = applied to a furnace that <i>drives back</i> or <i>directs</i> the flame upon the ore.</p>
saleratus	<p><i>sal</i>, salt + <i>aer</i>, air = a term applied to baking powder because it is a <i>salt</i> which <i>aerates</i>.</p>
silicon	<p><i>silex</i> (<i>silicis</i>), flint = an element so called because it is an essential element of <i>flint</i> and other rocks.</p>
spectroscope	<p><i>spectrum</i>, an image (= a continuous band of successive prismatic colors) + <i>σκοπεῖν</i> (<i>skopein</i>), to view = an instrument with which to <i>view</i> and study a <i>spectrum</i> from any source.</p>
stalactite	<p><i>σταλᾶν</i> (<i>stalan</i>), to drop = a dropping, oozing = a formation hanging from the roof produced by a constant <i>trickling down</i> of water with carbonate of lime.</p>
stalagmite	<p><i>σταλᾶν</i> (<i>stalan</i>), to drop + <i>μα</i> (<i>ma</i>), the result produced = a formation <i>produced</i> upon floors of caverns by the dropping of carbonate of lime.</p>
sublimate	<p><i>sublimis</i>, uplifted = a substance brought into a state of <i>vapor</i> by heat and then condensed, hence = purified. = a pure Latin word with the same meaning.</p>
sulphur	<p><i>tendere</i>, to stretch = the property of being <i>stretched out</i>.</p>
tensile	<p><i>θέρμος</i> (<i>thermos</i>), heat = pertaining to <i>heat</i>.</p>
thermal	<p><i>Tiburtinum</i>, belonging to Tivoli or Anio = the name applied to the deposit of limestone along the course of the <i>Anio</i> and then to similar deposits in Italy.</p>
travertine	<p><i>vitreus</i>, of glass = a substance so called because of its frequently <i>glassy</i> appearance.</p>
vitriol	